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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
CURS, NATHAN M

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/544,251	PINCEMIN, ERWAN	
	Examiner	Art Unit	
	NATHAN M. CURS	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 October 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

3. Claim 2 is objected to because of the following informalities:

Claim 2 in page 8 lines 21-22 recites the acronyms “HOM” and “SLA” without defining them.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 5, 9 and 10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 5 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim 9 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim 10 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 112

6. Claims 1-6, 9 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 in page 8 lines 14-16 recites "a signal above said threshold is liable to be subjected to non-linear distortion". The language “liable to be" indicates optionality; thus, its not clear if the language is limiting.

Claim 2 in page 8 lines 21-22 recites “HOM” and "SLA” implying “high order mode” and “super large area”. “High" and "super large" are relative terms, which render the claim indefinite. The terms are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 3 in page 8 line 25 recites the language “it includes”; it's not clear what “it” is referring to.

Claim 4 in page 8 line 32 recites “HOM” and "SLA” implying “high order mode” and “super large area”. “High" and "super large" are relative terms, which render the claim indefinite. The terms are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 5 provides for the use of an apparatus, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process

applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 6 in page 9 lines 12-14 recites "a signal above said threshold is liable to be subjected to non-linear distortion". The language “liable to be" indicates optionality; thus, its not clear if the language is limiting.

Also, claim 6 in page 9 lines 2-3 recites the language “the steps consisting in” followed by an “emitting” step and a “conveying” step. However, the claim in page 9 lines 5-6 then recites “the method further comprises” followed by additional steps. The closed-ended language "consisting in" conflicts with the open-ended language “further comprises”, thus the scope of the claim is unclear.

Claim 9 provides for the use of a module, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 10 provides for the use of an amplifier module, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 5, 6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stock et al. ("Stock") (US Patent No. 6249630) in view of Moeller (US Patent Application Publication No.2004/0062552) and further in view of Harstead et al. ("Harstead") (US Patent No. 5912749).

Regarding claim 1, Stock discloses apparatus for transmitting a signal through an optical transmission network (fig. 1 and col. 6 lines 28-40), the apparatus comprising a pulse emitter and at least one line fiber for conveying at least one pulse in said line fiber (fig. 1 elements 10 and 30 and col. 6 lines 41-51), wherein the apparatus comprises a spreader module for spreading pulses, said spreader module comprising a propagation medium that is dispersive, said propagation medium presenting accumulated chromatic dispersion (fig. 1 element 20 and col. 6 lines 41-49, where the optical fiber of the pulse stretcher is inherently dispersive presenting accumulated chromatic dispersion) that is high enough to lower the peak power of the pulse to below a predetermined threshold, where a signal above said threshold is liable to be subjected to non-linear distortion in the line fiber (col. 5 lines 33-39, col. 6 lines 48-49 and col. 8 lines 15-29, where the predetermined threshold is the power level that the pulse power is reduced from in order to avoid non-linear effects), said spreader module being disposed between the emitter

and the line fiber. Stock does not specifically disclose that the optical transmission network is a data transmission network. Moeller discloses an optical data transmission system where pulse peak power is reduced to avoid non-linear effects and extend optical communication. Since Moeller reveals that pulse peak power reduction can also be used in an optical data communication system to avoid non-linear effects, increase transmission performance, and extended communication, One of ordinary skill in the art at the time of the invention could have modified Stock to transmit data from the source point to the destination point, and the results would have been predictable. Namely, the system would provide long distance optical data communication.

Also, Stock does not explicitly disclose that the spreader module is for linearly spreading pulses, the propagation medium being linear. However, Harstead discloses linearly spreading optical pulses using a linear dispersion fiber (col. 4 lines 8-12). Since Harstead linear dispersion fiber and the fiber of Stock's stretcher both spread optical pulses, one of ordinary skill in the art at the time of the invention could have substituted linear dispersion fiber like that of Harstead for the fiber of Stock's stretcher, and the results would have been predictable; namely, the linear dispersion fiber would spread the pulses as required.

Regarding claim 5, the combination of Stock, Moeller and Harstead discloses the use of apparatus according to claim 1, and discloses optical pulse widths of less than 100 ps (Stock: col. 6 lines 34-36), but does not disclose that the data rate is not less than 160 Gbit/s. However, a data rate of not less than 160 Gbit/s is equal to a bit interval of not more than 6.25 ps. The disclosed pulse widths of the combination of less

than 100 ps overlap with the claimed bit interval of 6.25 ps. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a data rate of 160 Gbit/s for the data transmission of the combination, because where claimed ranges overlaps or lie inside ranges disclosed by the prior art, a prima facie case of obviousness exists (see MPEP § 2144.05).

Regarding claims 6 and 9, Stock discloses a method of transmitting a signal through an optical transmission network (fig. 1 and col. 6 lines 28-40), the method comprising the steps consisting in emitting at least one pulse and in conveying said pulse via an optical transmission network comprising at least one line fiber (fig. 1 elements 10 and 30 and col. 6 lines 41-51), wherein the method further comprises, prior to conveying the pulse to the line fiber, a step consisting in causing the pulse to be conveyed by a propagation medium that is dispersive, said propagation medium presenting accumulated chromatic dispersion (fig. 1 element 20 and col. 6 lines 41-49, where the optical fiber of the pulse stretcher is inherently dispersive presenting accumulated chromatic dispersion) that is high enough to lower the peak power of the pulse to below a predetermined threshold, where a signal above said threshold is liable to be subjected to non-linear distortion in the line fiber (col. 5 lines 33-39, col. 6 lines 48-49 and col. 8 lines 15-29, where the predetermined threshold is the power level that the pulse power is reduced from in order to avoid non-linear effects). Stock does not specifically disclose that the optical transmission network is a data transmission network. Moeller discloses an optical data transmission system where pulse peak power is reduced to avoid non-linear effects and extend optical communication. Since

Moeller reveals that pulse peak power reduction can also be used in an optical data communication system to avoid non-linear effects, increase transmission performance, and extended communication, One of ordinary skill in the art at the time of the invention could have modified Stock to transmit data from the source point to the destination point, and the results would have been predictable. Namely, the system would provide long distance optical data communication.

Also, Stock does not explicitly disclose that the propagation medium is also linear. However, Harstead discloses linearly spreading optical pulses using a linear dispersion fiber (col. 4 lines 8-12). Since Harstead linear dispersion fiber and the fiber of Stock's stretcher both spread optical pulses, one of ordinary skill in the art at the time of the invention could have substituted linear dispersion fiber like that of Harstead for the fiber of Stock's stretcher, and the results would have been predictable; namely, the linear dispersion fiber would spread the pulses as required.

Regarding claim 8, the combination of Stock, Moeller and Harstead discloses the use of a method according to claim 6, and discloses optical pulse widths of less than 100 ps (Stock: col. 6 lines 34-36), but does not specifically disclose transmission at a data rate of not less than 160 Gbit/s. However, a data rate of not less than 160 Gbit/s is equal to a bit interval of not more than 6.25 ps. The disclose pulse widths of the combination of less than 100 ps overlap with the claimed bit interval of 6.25 ps. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a data rate of 160 Gbit/s for the data transmission of the combination, because where

claimed ranges overlaps or lie inside ranges disclosed by the prior art, a prima facie case of obviousness exists (see MPEP § 2144.05).

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stock (US Patent No. 6249630) in view of Moeller (US Patent Application Publication No. 2004/0062552) and further in view of Harstead (US Patent No. 5912749) as applied to claims 1, 5, 6, 8 and 9 above, and further in view of Johnson et al. ("Johnson") (US Patent Application Publication No. 2002/0176676).

Regarding claim 2, the combination of Stock, Moeller and Harstead discloses transmission apparatus according to claim 1, but does not specifically disclose that the spreader module comprises a fiber of the HOM type, of the SLA type, or having photonic crystals. Johnson discloses using photonic crystal waveguides for tailored dispersion profile waveguides (abstract and paragraph 0008). One of ordinary skill in the art at the time of the invention could have used a tailored photonic crystal waveguide for the waveguide of the stretcher of the combination, and the results would have predictable; namely, the dispersion profile of the waveguide would be tailored to provide the necessary amount of dispersion to stretch the pulses. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a tailored photonic crystal waveguide for the waveguide of the stretcher of the combination, the predictable result of providing the necessary amount of dispersion to stretch the pulses used a tailored waveguide.

10. Claims 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stock (US Patent No. 6249630) in view of Moeller (US Patent Application Publication No. 2004/0062552) and further in view of Harstead (US Patent No. 5912749) as applied to claims 1, 5, 6, 8 and 9 above, and further in view of Bai (US Patent Application Publication No. 2002/0036812).

Regarding claim 3, the combination of Stock, Moeller and Harstead discloses transmission apparatus according to claim 1, but does not disclose that it includes a plurality of amplifier modules disposed regularly along the line fiber, each including a dispersion compensation module comprising a propagation medium that is dispersive and linear. Bai discloses using an optical amplifier with a linear dispersion compensator for each span of a transmission line, to compensate for dispersion of the transmission line affecting the optical pulses and to maintain intensity of the optical pulses (figs. 1 and 2 and paragraph 0030). It would have been obvious to one of ordinary skill in the art at the time of the invention to use multiple spans in the transmission line of the combination, each span with an amplifier plus linear dispersion compensator, to provide the benefit of compensating for dispersion of the line and maintaining intensity of the optical pulses. The combination as described above does not specifically disclose the dispersion compensator and optical amplifier as a single module. However, the Office takes official takes official notice that its well known to group in-line optical amplifiers and in-line dispersion compensators into the same module or circuit pack. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to group in-line optical amplifiers and in-line dispersion compensators into the same

module or circuit pack, to provide the benefit of reducing the number of different physical components and optimizing equipment space requirements.

Regarding claim 7, the combination of Stock, Moeller and Harstead discloses a transmission method according to claim 6, but does not disclose that a transmitted pulse is amplified by amplifier modules disposed regularly along the line fiber, or that the pulse is conveyed within the amplifier modules in a propagation medium that is dispersive and linear in order to compensate the dispersion to which the pulse has been subjected in the line fiber. Bai discloses using an optical amplifier with a linear dispersion compensator for each span of a transmission line, to compensate for dispersion of the transmission line affecting the optical pulses and to maintain intensity of the optical pulses (figs. 1 and 2 and paragraph 0030). It would have been obvious to one of ordinary skill in the art at the time of the invention to use multiple spans in the transmission line of the combination, each span with an amplifier plus linear dispersion compensator, to provide the benefit of compensating for dispersion of the line and maintaining intensity of the optical pulses. The combination as described above does not specifically disclose the dispersion compensator and optical amplifier as a single module. However, the Office takes official takes official notice that its well known to group in-line optical amplifiers and in-line dispersion compensators into the same module or circuit pack. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to group in-line optical amplifiers and in-line dispersion compensators into the same module or circuit pack, to provide the benefit of

reducing the number of different physical components and optimizing equipment space requirements.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stock (US Patent No. 6249630) in view of Moeller (US Patent Application Publication No. 2004/0062552) and further in view of Harstead (US Patent No. 5912749), and further in view of Bai (US Patent Application Publication No. 2002/0036812) as applied to claims 3 and 7 above, and further in view of Johnson (US Patent Application Publication No. 2002/0176676).

Regarding claim 4, the combination of Stock, Moeller, Harstead and Bai discloses transmission apparatus according to claim 3, but does not specifically disclose that the dispersion compensation module comprises a fiber of the HOM type, the SLA type, or having photonic crystals. Johnson discloses using photonic crystal waveguides for tailored dispersion profile waveguides (abstract and paragraph 0008). One of ordinary skill in the art at the time of the invention could have used a tailored photonic crystal waveguide for the waveguide of the stretcher of the combination, and the results would have predictable; namely, the dispersion profile of the waveguide would be tailored to provide the necessary amount of dispersion to stretch the pulses. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a tailored photonic crystal waveguide for the waveguide of the stretcher of the combination, the predictable result of providing the necessary amount of dispersion to stretch the pulses used a tailored waveguide.

12. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bai (US Patent Application Publication No. 2002/0036812).

Regarding claim 10, Bai discloses the use of an amplifier arrangement in a line fiber for transmitting pulses into the line, said amplifier arrangement comprising pulse amplifier means and a compensation module comprising a propagation medium that is dispersive and linear in order to increase the peak power and reduce the width of the pulses (figs. 1 and 2 and paragraph 0030, where compensating for dispersion and maintaining intensity of optical pulses indicates that the pulses arriving at the arrangement are spread out and reduced due to dispersion and the compensation and amplifier reduce the pulse width and increase the pulse power back to the desired level). Bai does not specifically disclose the dispersion compensator and optical amplifier as a single module. However, the Office takes official takes official notice that its well known to group in-line optical amplifiers and in-line dispersion compensators into the same module or circuit pack. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to group in-line optical amplifiers and in-line dispersion compensators into the same module or circuit pack, to provide the benefit of reducing the number of different physical components and optimizing equipment space requirements.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHAN M. CURS whose telephone number is (571)272-3028. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NATHAN M CURS/

Examiner, Art Unit 2613